

## PATENT COOPERATION TREATY

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## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 6550-072/POA		<b>FOR FURTHER ACTION</b>		See Form PCT/IPEA/416
International application No. PCT/US2004/021451		International filing date (day/month/year) 02.07.2004		Priority date (day/month/year) 03.07.2003
International Patent Classification (IPC) or national classification and IPC C12N15/82, C07K14/085				
Applicant BOARD OF TRUSTEES OPERATING MICHIGAN STATE...				
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> sent to the applicant and to the International Bureau a total of sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in Item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>				
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>				
Date of submission of the demand  01.02.2005		Date of completion of this report  04.10.2005		
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016		Authorized Officer  Oderwald, H  Telephone No. +31 70 340-		



**INTERNATIONAL PRELIMINARY REPORT  
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**Box No. I Basis of the report**

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
  - ☐ publication of the international application (under Rule 12.4)
  - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

**Description, Pages**

1-45 as originally filed

**Sequence listings part of the description, Pages**

1-6 as originally filed

**Claims, Numbers**

1-235 as originally filed

**Drawings, Sheets**

1/6-6/6 as originally filed

☒ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing *(specify)*:
  - ☐ any table(s) related to sequence listing *(specify)*:
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing *(specify)*:
  - ☐ any table(s) related to sequence listing *(specify)*:

\* If item 4 applies, some or all of these sheets may be marked "superseded."

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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**1. Statement**

Novelty (N)	Yes: Claims	1-235
	No: Claims	
Inventive step (IS)	Yes: Claims	1-235
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-235
	No: Claims	

**2. Citations and explanations (Rule 70.7):**

**see separate sheet**

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**Supplemental Box relating to Sequence Listing**

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**Continuation of Box I, item 2:**

1. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this report has been established on the basis of:
  - a. type of material:
    - ☒ a sequence listing
    - ☐ table(s) related to the sequence listing
  - b. format of material:
    - ☒ in written format
    - ☒ in computer readable form
  - c. time of filing/furnishing:
    - ☐ contained in the international application as filed
    - ☐ filed together with the international application in computer readable form
    - ☒ furnished subsequently to this Authority for the purposes of search and/or examination
    - ☒ received by this Authority as an amendment on
2. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
3. Additional observations, if necessary:

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**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement**

Reference is made to the following documents:

- D1: WO 02/12522 A (THE UNIVERSITY OF SURREY; ROBERTS, LISA, ORIEL; BELSHAM, GRAHAM, JOHN) 14 February 2002 (2002-02-14)  
D2: TOTH R L ET AL: "A novel strategy for the expression of foreign genes from plant virus vectors" FEBS LETTERS, ELSEVIER SCIENCE PUBLISHERS, AMSTERDAM, NL, vol. 489, no. 2-3, 2 February 2001 (2001-02-02), pages 215-219, XP00424888 ISSN: 0014-5793  
D3: WO 02/29068 A (ICON GENETICS AG; GLEBA, YURI; DOROKOV, YURI; IVANOV, PETER; ATABEKOV) 11 April 2002 (2002-04-11)

D1, which is considered to represent the most relevant state of the art, discloses a method of conferring disease resistance to a transgenic plant using a construct comprising an internal ribosome entry site (IRES).

D2 discloses a method for expressing heterologous genes in transgenic plant using an IRES or its complementary sequence.

D3 discloses methods for expressing heterologous genes -in either sense or antisense orientation- in transgenic plants using an IRES.

The subject-matter of claim 1 is therefore new (Article 33(2) PCT). The same holds true for claims 2-235.

The problem to be solved by the present invention may be regarded as the provision of an alternative method for conferring disease resistance to a transgenic plant.

The solution is the provision of a method in using a sequence complementary to a coding sequence for a heterologous resistance gene in combination with a sequence complementary to an IRES.

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The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

None of the cited prior art documents discloses nor suggests the use of a sequence complementary to a coding sequence for a heterologous resistance gene in combination with a sequence complementary to an IRES.

The same applies mutatis mutandis to the independent claims 30, 73, 119, 135, 137, 141, 142, 152, 154, 158, 159, 169, 175, 176, 196, 216. The dependent claims as such also meet the requirements of the PCT with respect to novelty and inventive step.